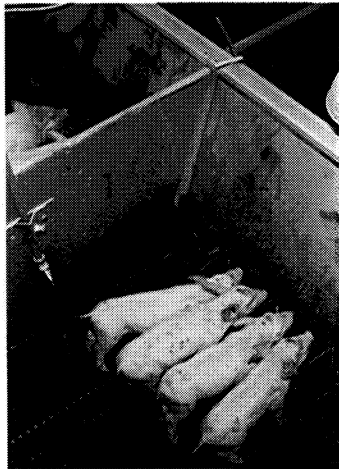


## Robotic Sow



**I**n swine farming, 15 to 25 percent of piglets die before weaning and that poses a serious economic problem for hog producers. Many of the reasons for high piglet mortality center about the mother pig, or sow. Sometimes a sow will accidentally crush her piglets, sometimes she will reject or abuse a piglet. Frequently a litter is oversized and the sow cannot accommodate all her piglets for nursing. In some cases, sows are unable to nurse due to lactation disorders; in others, a sow may die while its litter is very young.

For years, people in the swine industry have tried without success to increase hog production efficiency by

developing a machine that can nurse piglets from birth to weaning. In 1986, a Canadian group claimed a breakthrough with the introduction of the Farmatic Robotic Sow, manufactured by Farmatic, London, Ontario. The system incorporates NASA technology.

The Farmatic mechanical mother pig comes in two models, one with eight artificial teats (rubber nipples) and another with 16. Shortly before feeding time, the automated sow releases a prescribed amount of formula from a refrigerated compartment into a warming chamber, where the milk is heated to the desired temperature. At feeding time, a heat lamp simulating a sow's body warmth is automatically turned on and the machine emits rhythmic grunts like a mother pig summoning her piglets. As the piglets scamper to their mechanical mother, a panel across the front of the machine opens to expose the row of nipples.

The Farmatic Robotic Sow is the result of several years research at the University of Guelph, Ontario, by Dr. Frank Hurnik, who built and successfully operated a prototype system (above) with which he raised 58 piglets with only a single loss. Farmatic's research and development team then refined the University of Guelph apparatus, drastically reducing the complexity of the system and incorporating advanced electronics technology to produce a Robotic Sow that would maintain reliability in the harsh hog barn environment

and operate on only 12 volts for safety (below).

NASA technology employed by Farmatic played a key role. The piglets' milk had to be cooled until used, then warmed to a precise temperature. With conventional technology, this would have required a refrigeration compressor, a coil and a supply of freon for cooling, plus a heating cable and a thermostat for heating. Use of such equipment would have involved too many mechanical parts and would not have permitted low voltage operation. Instead, Farmatic used miniature heat pumps, originally developed by NASA for satellite cooling, that have no moving parts, measure only one inch square and perform both the heating and cooling functions. ▲

